Name:

at1121exam_practice: Radicals and Squares (v618)

Question 1

Simplify the radical expressions.

$\sqrt{18}$ $\sqrt{98}$ $\sqrt{75}$

$\sqrt{3 \cdot 3 \cdot 2}$ $\sqrt{7 \cdot 7 \cdot 2}$ $\sqrt{5 \cdot 5 \cdot 3}$

$3\sqrt{2}$ $7\sqrt{2}$ $5\sqrt{3}$

Question 2

Find all solutions to the equation below:

$$\frac{(x-9)^2}{3} - 8 = 4$$

First, add 8 to both sides.

$$\frac{(x-9)^2}{3} = 12$$

Then, multiply both sides by 3.

$$(x-9)^2 = 36$$

Undo the squaring. Remember the plus-minus symbol.

$$x - 9 = \pm 6$$

Add 9 to both sides.

$$x = 9 \pm 6$$

So the two solutions are $x = 15$ and $x = 3$.

Question 3

By completing the square, find both solutions to the given equation. *You must show work for full credit!*

$$x^2 - 8x = -7$$

$$x^2 - 8x + 16 = -7 + 16$$
$$x^2 - 8x + 16 = 9$$
$$(x-4)^2 = 9$$
$$x - 4 = \pm 3$$
$$x = 4 \pm 3$$
$$x = 7 \quad \text{or} \quad x = 1$$

Question 4

A quadratic polynomial function is shown below in standard form.

$$y = 2x^2 - 24x + 77$$

Express the function in **vertex form** and identify the **location** of the vertex.

From the first two terms, factor out 2 .

$$y = 2(x^2 - 12x) + 77$$

We want a perfect square. Halve -12 and square the result to get 36 . Add and subtract that value inside the parentheses.

$$y = 2(x^2 - 12x + 36 - 36) + 77$$

Factor the perfect-square trinomial.

$$y = 2((x-6)^2 - 36) + 77$$

Distribute the 2.

$$y = 2(x-6)^2 - 72 + 77$$

Combine the constants to get **vertex form**:

$$y = 2(x-6)^2 + 5$$

The vertex is at point $(6, 5)$.